No. 7900092

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Great Plains Research Company, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

ALFALFA

'Cimarron'

PLANT VARIETY PROTECTION OFFICE · DEPARTMENT OF AGRICULTURE

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington *this* 26th *day of* March *in the year of our Lord one thousand nine hundred and* eighty-one.

Attest:

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

Secretary of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

FORM APPROVED
OMB NO. 40-R3822

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY	1b. VARIETY NAME	FOR OFFICIAL USE ONLY
GPR 78	Cimarron	PV NUMBER 7900092
2. KIND NAME: Alfalfa	3. GENUS AND SPECIES NAME: Medicago sativa L.	FILING DATE 7/19/79 · TIME 2:30 A.M. (P.M.)
4. FAMILY NAME (BOTANICAL): Legume; LEGUMINOSAE DCB	5. DATE OF DETERMINATION: January 1, 1978	FEE RECEIVED $ 500.00 $ 250.00 · DATE 7/19/79 2/23/81

6. NAME OF APPLICANT(S)	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*	8. TELEPHONE AREA CODE AND NUMBER
Great Plains Research Co. Inc.	P. O. Box 1318 Stillwater, Oklahoma 74074	404-743-0944

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)*	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION	11. DATE OF INCORPORATION
Croporation	Oklahoma	10-17-77

12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS:
Thaddeus Hillery Busbice
1221 Pioneer Court, Cary, N. C. 27511

13. **CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:**

- [X] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [X] 13B. Exhibit B, Novelty Statement.
- [X] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [ ] 13D. Exhibit D, Additional Description of the Variety.

14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a). (If "Yes," answer 14B and 14C below.)* [ ] YES [X] NO

14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED?
[X] YES [ ] NO	[X] FOUNDATION [ ] REGISTERED [X] CERTIFIED

15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? [X] YES [ ] NO

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

March 11 1980 — (DATE)

Thaddeus H. Busbice — (SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT)

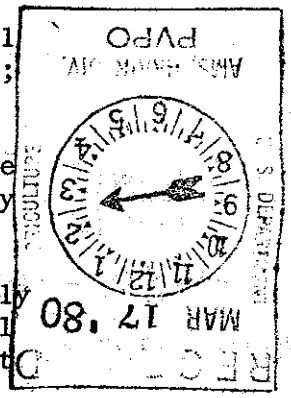
INSTRUCTIONS

GENERAL: Send an original copy of the application and exhibits, at least 2,500 viable seeds, and $500 fee ($250 filing fee and $250 examination fee) to U.S. Dept. of Agriculture, Agricultural Marketing Service, Livestock, Poultry, Grain and Seed Division, Plant Variety Protection Office, National Agricultural Library Building, Beltsville, Maryland 20705. (See section 180.175 of the Regulations and Rules of Practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

5 Give the date the applicant determined that he had a new variety based on (1) the definition in section 41(a) of the Act and (2) the date a decision was made to increase the seed.

13a Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4) evidence of uniformity and stability.



13b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties: (1) identify these varieties and state all differences objectively; (2) attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.

13c Fill in the Exhibit C, Objective Description form, for all characteristics for which you have adequate data.

13d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe, such as, plant habit, plant color, disease resistance, etc.

14a If "YES" is specified (seed of this variety be sold by variety name only as a class of certified seed) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled, his decision published, or the certificate has been issued. However, if the applicant specified "NO," he may change his choice. (See section 180.16 of the Regulations and Rules of Practice.)

15a See section 42 of the Plant Variety Protection Act and section 180.7 of the Regulations and Rules of Practice.

13A Exhibit A, Origin and Breeding History of Variety (See Section 52 of the Plant Variety Protection Act).

The germplasm of Cimarron consists of 70 percent Arc, 20 percent WL 318, and 10 percent Saranac AR. Selected fractions of each variety were interpollinated to produce breeder seed in a field near El Centro, California. Foundation seed was produced in Oklahoma. The major breeding consideration was to produce a broadly adapted variety, devoid of inbreeding depression, having predictable yield potential, possessing adequate winterhardiness for most of the United States, and having adequate levels of resistance to the alfalfa weevil, bacterial wilt, and anthracnose and genetic complementation for other important characteristics.

Selection was based on the principles of genetic correlation and genetic complementation. The larger seed from each germplasm source was selected. Such selection changes the cytoplasmic composition of the source material, which in turn increases the flower size, nectar content, and pollen production of the resulting variety. Such selection changes the genotypic composition of the resulting variety, making phenotypic plant selection unnecessary to maintain plant type and heterosis.

The variety is open pollinated and stable, and no variants appear. All seed are produced under contract with the Great Plains Research Company, under inspection by state seed certifying agencies. We believe Cimarron to be uniform in growth habit and appearance in relation to other alfalfa varieties on the market.

13B. Exhibit B, Novelty Statement

Cimarron is novel in that it differs from other varieties in combined disease and insect resistance.

Cimarron most closely resembles the varieties Arc and WL318.

Cimarron is different from Arc in that Cimarron has intermediate resistance to phytophthora root-rot and high resistance to bacterial wilt, while Arc has very low resistance to phytophthora root-rot and intermediate resistance to bacterial wilt. (Minn. Misc. Report No. 24, 1977, Table 29) DCB 4 Feb 81

Cimarron differs from WL318 in that Cimarron has intermediate resistance to anthracnose while WL318 has low resistance to anthracnose. This difference is confirmed in the following studies (copies of data attached):

1. Alfalfa Variety-Irrigation Test. 1979. J. S. Rice and V. L. Quisenberry, Clemson University, Clemson, South Carolina.

2. Anthracnose Resistance Test. January 23, 1979. T. H. Busbice, Great Plains Research Company, Inc., Cary, North Carolina.

3. Response of 24 Alfalfa Cultivars and Breeding Lines to Inoculation in the Greenhouse with Race 1 and 2 of Colletotrichum trifolii. 1981. R. E. Welty, USDA, Oxford, North Carolina.

Cimarron can be distinguished further from WL318 by relative resistance to Sclerotinia crown and stem rot disease. Cimarron has shown significantly more resistance to Sclerotina than WL318. (See Table attached.)

Because Saranac AR was used in the breeding of Cimarron, it is necessary to show that Cimarron is distinct from Saranac AR. In resistance to Anthracnose Race 2, Saranac AR shows significantly more resistance to Race 2 than does Cimarron. This difference is confirmed in the following studies (copies of data attached):

1. Evaluation of 2-week-old Seedlings of Select Alfalfa Cultivars and Experimental Lines for Resistance to Race 1 and Race 2 of Colletotrichum trifolii. April 1980. Dr. James Elgin, Alfalfa Project, BARC, Beltsville, Maryland.

2. Anthracnose Resistance Test. January 23, 1979. T. H. Busbice, Great Plains Research Company, Inc., Cary North Carolina.

3. Response of 24 Alfalfa Cultivars and Breeding Lines to Inoculation in the Greenhouse with Race 1 and 2 of Colletotrichum trifolii. 1981. R. E. Welty, USDA, Oxford, North Carolina.

Anthracnose Resistance Test

T. H. Busbice
Great Plains Research Company, Inc., Cary, N.C.
January 23, 1979

Variety	% Resistant Plants	
	Race 1	Race 2
Cimarron	44.9	2.0
Liberty	57.3	0.0
Saranac AR	48.8	33.3
Kanza	0	0.0
WL318	1.9	--
LSD .05	8.4	12.5

Field Evaluation for Resistance to Sclerotinia Crown and Stem Rot

T. H. Busbice
Great Plains Research Company, Inc., Cary, N.C.
April 11, 1979

Variety	% Survivors*
Cimarron	62.5
Kanza	10.0
Arc	45.0
WL318	35.0
LSD .05	16.0

*Plants showing little or no damage after heavy infection, remaining plants dead or completely defoliated.

FORM APPROVED. OMB NO. 40 R3712

FORM GR 470-32 (3/75)

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

EXHIBIT C

OBJECTIVE DESCRIPTION OF VARIETY

Alfalfa (Medicago sativa L. complex)

NAME OF APPLICANT(S)
Great Plains Research Company, Inc.

ADDRESS (*Street and No., or R.F.D. No., City, State, and Zip Code*)
P. O. Box 1318
Stillwater, Oklahoma 74074

VARIETY NAME OR TEMPORARY DESIGNATION
Cimarron

FOR OFFICIAL USE ONLY
PVPO NUMBER
7900092

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

NOTE: For single plant data a minimum of 100 plants is suggested

1. PRIMARY AREA OF ADAPTATION

[4] 1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEAST
4 = SOUTHEAST 5 = SOUTHWEST 6 = SOUTHERN PLAINS
7 = INTERMOUNTAIN

INDICATE AREA WHERE TEST WAS CONDUCTED. FURTHER EXPLANATION CAN GO IN COMMENTS AT THE END OF THE FORM.

[4] AREA TESTED
Also, areas 2 and 6

2. WINTER HARDINESS

[5] 1 = NON-HARDY (Mesa Sirsa) 3 = INTERMEDIATE NON-HARDY
5 = MODERATELY HARDY (Saranac) 7 = HARDY (Vernal)
9 = EXTREMELY HARDY (Norseman)

[6] AREA TESTED
Also, areas 2 and 4

[2] SOURCE OF INFORMATION: 1 = ANTICIPATED 2 = MEASURED

3. FALL GROWTH HABIT

[3] 1 = ERECT (Mesa Sirsa) 3 = SEMIERECT (DuPuits)
5 = INTERMEDIATE (Saranac) 7 = SEMIDECUMENT (Vernal)
9 = DECUMBENT (Norsement)

[2] AREA TESTED

4. RECOVERY AFTER FIRST SPRING CUTTING

[3] 1 = VERY FAST (Mesa Sirsa) 3 = FAST (Saranac) 5 = INTERMEDIATE
7 = SLOW (Vernal) 9 = VERY SLOW (Norseman)

[4] AREA TESTED

5. FLOWERING DATE (FIRST SPRING GROWTH)

[ ][ ] DAYS EARLIER THAN . . . . .
[ ][ ] DAYS LATER THAN . . . . .

[ ] 1 = MESA SIRSA 2 = LAHONTAN
3 = SARANAC 4 = VERNAL
5 = NORSEMAN

[ ] AREA TESTED

6. CROWN TYPE

[7] 1 = SPREADING ROOTS 3 = SPREADING RHIZOMES (Teton)
5 = BROAD (Vernal) 7 = INTERMEDIATE (Saranac)
9 = NARROW (Mesa Sirsa)

[4] AREA TESTED
Also, area 6

7. PLANT COLOR

[5] 3 = DARK GREEN (Weevlchek) 5 = GREEN (Vernal)
7 = LIGHT GREEN (Ranger)

[4] AREA TESTED

8. HAIRINESS

[0][0][0] % PLANTS WITH PUBESCENT STEMS

[0][0][0] % PLANTS WITH PUBESCENT PODS

9. POD SHAPE

[1][0][0] % PLANTS WITH TIGHT COILS

[0][0][0] % PLANTS WITH LOOSE COILS

[0][0][0] % PLANTS WITH SICKLE PODS (Less than 1 coil)

10. GIVE ITEM LENGTH FREQUENCY DISTRIBUTION FOR SUBMITTED AND 1 TO 5 STANDARD VARIETIES 1/

VARIETY NAME	STEM LENGTH FREQUENCY DISTRIBUTION 2/											AVERAGE STEM LENGTH
	0 – 5 mm. %	6 – 10 mm. %	11 – 15 mm. %	16 – 20 mm. %	21 – 30 mm. %	31 – 40 mm. %	41 – 50 mm. %	51 – 60 mm. %	61 – 70 mm. %	71 – 80 mm. %	81 + mm. %	

11. FLOWER COLOR 3/ (DETERMINE COLOR ON FRESHLY OPENED FLOWERS)

62.0 % PURPLE 37.9 % VARIEGATED 00.1 % YELLOW 000 % CREAM 000 % WHITE

12. DISEASE, INSECT, AND NEMATODE RESISTANCE: (Enter resistance of submitted and check cultivars. Circle check cultivars used.)

DISEASE	CULTIVAR	% RESISTANT PLANTS	AVG. SEVERITY INDEX (ASI)	ASI LSD .05	TEST, YEAR & LOCATION 4/
BACTERIAL WILT	(SUBMITTED)	44.3			University of Minnesota 1979, St. Paul, Minn.
	(RES. CK.) VERNAL	39.2			
	(SUS. CK.) NARRAGANSETT	0.0			
ANTHRACNOSE Race 1	(SUBMITTED)	44			Great Plains Research Co. Inc. 1979, Greenhouse, Cary N. C. S.D. .05 applies to % data
	(RES. CK.) ARC	57			
	(SUS. CK.) ~~SARANAC~~ Kanza	1			
COMMON LEAF SPOT	(SUBMITTED)				
	(RES. CK.) RAMSEY				
	(SUS. CK.) RANGER				
DOWNY MILDEW	(SUBMITTED)				
	(RES. CK.) SARANAC				
	(SUS. CK.) KANZA				
PHYTOPHTHORA ROOT ROT	(SUBMITTED)	13.0	4.04		of Minnesota. aul, Minn.
	(RES. CK.) AGATE	43.7	3.15		
	(SUS. CK.) SARANAC	2.0	4.80		
Sclerotinia crown rot ~~OTHER~~	(SUBMITTED)	63	--	16	Great Plains Research Co. Inc. 1979. field, Lexington, N. C. L.S.D. .05 applies to % data
	(RES. CK.) Arc	45	--		
	(SUS. CK.) Kanza	10	--		

47 42 BW 0

13 43 PhR2 2

1/ Preferred standards: Saranac, Vernal, Norseman, Lahontan, Mesa Sirsa. Twelve hours light at 25° C with 20,000 lux of cool white florescent; 2,000 lux of incandescent-filament light and twelve hours darkness at 5° C.

2/ From cotyledonary node to tip of stem 20 days after planting.

3/ For further clarification consult USDA Agricultural Handbook No. 424.

4/ Give: The institution in charge of test, (2) year, and (3) location of test. Describe test procedure if it differs from procedure suggested in ARS-NC-19, September 1974.

12. DISEASE, INSECT AND NEMATODE RESISTANCE: (Enter resistance of submitted and check cultivars. Circle check cultivars used.)

DISEASE	CULTIVAR	% RESISTANT PLANTS	AVG. SEVERITY INDEX (ASI)	ASI LSD .05	TEST, YEAR & LOCATION 4/
Fusarium Wilt	(SUBMITTED)	57.6	2.24	0.64	University of Minnesota. 1980. St. Paul, Minn.
OTHER	Moapa-69 (RES. CK.)	90.3	1.18		
	MnGN-1 (SUS. CK.)	6.9	4.56		
OTHER	(SUBMITTED)				
	(RES. CK.)				
	(SUS. CK.)				

INSECT	CULTIVAR	% SEEDLING SURVIVAL	AVG. SEVERITY INDEX (ASI)	ASI LSD .05	TEST, YEAR & LOCATION 4/
PEA APHID	(SUBMITTED)	73	--	14	Great Plains Research Co. Inc. 1979. Greenhouse, Cary, N. C. L.S.D. .05 apples to % data
	(RES. CK.) KANZA	72	--		
	(SUS. CK.) RANGER	14	--		
SPOTTED ALFALFA APHID	(SUBMITTED)	64	--	15	Great Plains Research Co. Inc. 1979. field, Cary, N. C. L.S.D. .05 applies to % data
	(RES. CK.) KANZA	65	--		
	Arc (SUS. CK.) ~~RANGER~~	37	--		

INSECT	CULTIVAR	% DEFOLIATION	AVG. SEVERITY INDEX (ASI)	ASI LSD .05	TEST, YEAR & LOCATION 4/
ALFALFA WEEVIL	(SUBMITTED)	46	--	8	Great Plains Research Co. Inc. 1980. field, Cary, N. C. DCB PER PHONE CONVERSAT OF 26 JAN 81 L.S.D. .05 applies to % data
	Arc (RES. CK.) ~~AHK~~	28	--		
	Kanza (SUS. CK.) VERNAL	89	--		

INSECT	CULTIVAR	% RESISTANT PLANTS	EMERGED ADULTS PER PLANT	EMERGED LSD .05	TEST, YEAR & LOCATION 4/
ALFALFA SEED CHALCID	(SUBMITTED)				
	(RES. CK.) LAHONTAN				
	(SUS. CK.) SONORA				

INSECT	CULTIVAR	% RESISTANT PLANTS	AVG. SEVERITY INDEX (ASI)	ASI LSD .05	TEST, YEAR & LOCATION 4/
POTATO LEAF-HOPPER	(SUBMITTED)				
	(RES. CK.)				
	(SUS. CK.)				
OTHER	(SUBMITTED)				
	(RES. CK.)				
	(SUS. CK.)				

4/ Give: The institution in charge of test, (2) year, and (3) location of test. Describe test procedure if it differs from procedure suggested in ARS-NC-19, September 1974.

5

12. DISEASE, INSECT, AND NEMATODE RESISTANCE: (Enter resistance of submitted and check cultivars. Circle check cultivars used.)

INSECT	CULTIVAR	% RESISTANT PLANTS	AVG. SEVERITY INDEX (ASI)	ASI LSD .05	TEST, YEAR & LOCATION 4/
OTHER	(SUBMITTED)				
	(RES. CK.)				
	(SUS. CK.)				
NEMATODE	**CULTIVAR**	**% RESISTANT PLANTS**	**INDEX (ASI)**	**ASI LSD .05**	**TEST, YEAR & LOCATION 4/**
STEM NEMATODE	(SUBMITTED)				
	(RES. CK.) LAHONTAN				
	(SUS. CK.) RANGER				
NORTHERN ROOT KNOT NEMATODE	(SUBMITTED)				
	(RES. CK.) NEV. SYN. XX				
	(SUS. CK.) LAHONTAN				
SOUTHERN ROOT KNOT NEMATODE	(SUBMITTED)				
	(RES. CK.) MOAPA 69				
	(SUS. CK.) LAHONTAN				
OTHER	(SUBMITTED)				
	(RES. CK.)				
	(SUS. CK.)				

13. INDICATE A VARIETY THAT MOST CLOSELY RESEMBLES THE VARIETY SUBMITTED FOR THE FOLLOWING CHARACTERS:

CHARACTER	VARIETY	CHARACTER	VARIETY
AREA OF ADAPTATION	ARC	PLANT HEIGHT	WL 318
RECOVERY AFTER CUTTING	ARC	WINTER HARDINESS	SARANAC

REFERENCES

Barnes, D.K., and C.H. Hanson, An Illustrated Summary of Genetic Traits in Tetraploid and Diploid Alfalfa, ARS Technical Bul. 1370.
Barnes, D.K., et al, Standard Tests to Characterize Pest Resistance in Alfalfa Varieties. ARS-NC-19, September 1974.
Nittler, L.W., G.W. McKee, and J.L. Newcomer, Principles and Methods of Testing Alfalfa Seed for Varietal Purity. New York Agricultural Experiment Station Bul. 807.
USDA Agricultural Handbook No. 424.

COMMENTS